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From: Carlton H. Hoel
Texas Instruments Incorporated
Facsimile: 972-917-4418
Phone: 972-917-4365

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Rajendra K. Taluri et al.
Serial No: 09/632,543
Filed: 8/4/2000
Art Unit: 2612
Examiner: L. Nguyen
Docket No.: TI-28919
Conf. No.: 1760
Customer No.: 23494

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FACSIMILE COVER SHEET

<input checked="" type="checkbox"/> FACSIMILE COVER SHEET (1 SHEET) <input type="checkbox"/> NEW APPLICATION <input type="checkbox"/> DECLARATION <input type="checkbox"/> ASSIGNMENT <input type="checkbox"/> FORMAL DRAWINGS <input type="checkbox"/> INFORMAL DRAWINGS <input type="checkbox"/> CONTINUATION APP'N <input type="checkbox"/> DIVISIONAL APP'N		<input type="checkbox"/> AMENDMENT <input type="checkbox"/> EOT <input type="checkbox"/> NOTICE OF APPEAL <input checked="" type="checkbox"/> APPEAL <u>BRIEF (6 Pages)</u> <input type="checkbox"/> ISSUE FEE <input type="checkbox"/> REPLY BRIEF (IN TRIPLICATE)	
NAME OF INVENTOR(S): Rajendra K. Taluri et al.		RECEIPT DATE & SERIAL NO.: Serial No.: 09/632,543 Filing Date: 8/4/2000 Conf. No.: 1760	
TITLE OF INVENTION: Digital Still Camera System and Method			
FILE NO.: TI-28919	DEPOSIT ACCT. NO.: 20-0668		
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Texas Instruments Incorporated
PO Box 655474, M/S 3999
Dallas, TX 75265

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Appl.No.: 09/632,543
Appellant: Talluri et al
Filed: August 4, 2000
TC/AU: 2612
Examiner: Nguyen

Confirmation No.: 1760

Docket: TI-28919
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APPELLANTS' BRIEF

Commissioner for Patents
P.O.Box 1450
Alexandria VA 22313-1450

Sir:

The attached sheets contain the Rule 41.37 items of appellants' brief. The fee for filing a brief in support of the appeal was been previously paid, and the Commissioner is hereby authorized to charge any other necessary fees to the deposit account of Texas Instruments Incorporated, account No. 20-0668.

Respectfully submitted,



Carlton H. Hoel
Reg. No. 29,934
Texas Instruments Incorporated
PO Box 655474, M/S 3999
Dallas, Texas 75265
972.917.4365

Rule 41.37(c)(1)(i) Real party of interest

Texas Instruments Incorporated owns the application.

Rule 41.37(c)(1)(ii) Related appeals and interferences

There are no related dispositive appeals or interferences.

Rule 41.37(c)(1)(iii) Status of claims

Claims 1 and 3-6 are pending in the application with all claims finally rejected. This appeal involves the finally rejected claims.

Rule 41.37(c)(1)(iv) Status of amendments

There is no amendment after final rejection.

Rule 41.37(c)(1)(v) Summary of claimed subject matter

The invention provides an integrated circuit for a digital camera which includes at least three processors, a first programmable processor related to a user interface and control, a second programmable processor for image processing and compression, and a third processor for other operations. Application Figure 1b illustrates a preferred embodiment with a first processor 130 (ARM), a second processor 122 (DSP), and various third processors: 124 (imaging extension), 108 (burst mode compression/decompression), and 126 (VLC). Application pages 4-6 provide a terse summary of various operations of the processors. Claim 1 requires a third processor including four parallel multiply-and-accumulate units as illustrated in Fig.19. Claim 3 requires two of the processor provide image compression with one processor acting directly on the acquired image as illustrated in Fig.1b with burst mode processor 108 connected to CCD controller 102 and the DSP subsystem 120 only compressing images retrieved from memory.

Rule 41.37(c)(1)(vi) Grounds of rejection to be reviewed on appeal

The grounds of rejection to be reviewed on appeal are:

- (1) claims 1, 3, and 6 were rejected as unpatentable over the Safai reference in view of the Mizutani reference.
- (2) claim 4 was rejected as anticipated by the Fukuoka reference.
- (3) claim 5 was rejected as unpatentable over the Safai reference in view of the Mizutani and Fukuoka references.

Rule 41.37(c)(1)(vii) Arguments

(1) Claims 1, 3, and 6 were rejected as unpatentable over Safai in view of Mizutani.

With regard to claim 1, the Examiner cited Safai processors 312 and 310 of Fig.3 for the first and second processors of the claim and cited Mizutani Fig. 7 multipliers 85-87, 95-97 and adders 88-90, 98-100 for the multiply and accumulate units of the third processor of the claim.

Appellants reply that there is no suggestion to include a third processor in Safai as required by claim 1. Furthermore, the cited multipliers and adders of Mizutani do not form parallel multiply and accumulate units because there is no accumulation and the adders are not parallel. The accumulate function is an addition to the current contents to yield updated contents; see application Fig.19. In contrast, the adders of Mizutani have two inputs with neither being a feedback of the current adder contents; indeed, the adders of Mizutani do not retain outputs as required for accumulators. More explicitly, the two inputs to adder 88 are the outputs of multipliers 84-85, and the output of adder 88 is one of the two inputs to adder 89 with the other input being the output of multiplier 86. The output of adder 89 is one of the two inputs to adder 90 with the other input being the output of multiplier 87. The output of adder 90 is the input of multiplier 94 whose output is one of the two inputs to adder 98 with the other input being the output of multiplier 95. The output of adder 98 is one of the two inputs to adder 99 with the other input being the output of multiplier 96. The output of adder 99 is one of the two inputs to adder 100 with the other input being the output of

multiplier 97. The output of adder 100 appears to be the input of output buffer 76. Indeed, Mizutani's adders are not in parallel and do not accumulate as required by claim 1.

With regard to claim 3, the Examiner applied Safai as before (processors 310 and 312) and cited Mizutani JPEG unit 29 as the image compression unit.

Appellants again reply that claim 3 requires first and second processors plus a separate image compression unit; whereas Safai has image compression already in image processor 310 (see Safai Fig.4), and there is no suggestion to include another unit for image compression. Furthermore, claim 3 requires the separate image compression unit be able to act on the acquired image; in contrast, Mizutani Fig.2 shows JPEG unit 29 applied after input processing 21 and memory controller 22 and thus not acting on the acquired image. Indeed, Mizutani Fig.4 explicitly shows input processing 21 performs RGB → YCbCr color space conversion. (Application Fig.1b shows burst mode compression/decompression unit 108 directly connected to the CCD controller to get the acquired image, whereas DSP subsystem 120 gets an image from memory.)

With regard to claim 6, the Examiner applied Safai as before and cited Mizutani for camera peripherals.

Appellants rely upon the patentability of parent claim 1.

(2) Claim 4 was rejected as anticipated by Fukuoka; the Examiner cited Fukuoka Fig.1 CPU 11 for the first processor, compression circuit 7 for the second processor, and DSP 6 for the image processor.

Appellants reply that claim 4 requires a programmable second processor for image compression; whereas, Fukuoka only describes CPU 11 as doing various tasks (i.e., programmable) but does not suggest any programmability of compression circuit 7.

(3) Dependent claim 5 was rejected as unpatentable over Safai in view of Mizutani and Fukuoka. The Examiner cited Fukuoka for audio input.

Appellants rely upon the patentability of parent claim 1.

Rule 41.37(c)(1)(viii) Claims appendix

1. An integrated circuit for a digital still camera, comprising:
 - (a) a first programmable processor programmed to run control functions, said first processor coupled to a user interface, a controller for memory, and a controller for image acquisition;
 - (b) a second programmable processor programmed to run image processing and compression functions, said second processor coupled to said first processor; and
 - (c) a third processor coupled to said second processor, said third processor including at least four parallel multiply and accumulate units.

3. An integrated circuit for a digital still camera, comprising:
 - (a) a first programmable processor programmed to run control functions, said first processor coupled to a user interface, a controller for memory, and a controller for image acquisition;
 - (b) a second programmable processor programmed to run image processing and compression functions, said second processor coupled to said first processor; and
 - (c) an image compression unit separate from said second processor, said compression unit arranged to compress acquired images for storage in a memory and to decompress said compressed acquired images in said memory for restorage in said memory.

4. An integrated circuit for a digital still camera, comprising:
 - (a) a first programmable processor programmed to run control functions, said first processor coupled to a user interface, a controller for memory, and a controller for image acquisition;

(b) a second programmable processor programmed to run image processing and compression functions, said second processor coupled to said first processor; and

(c) a digital image processing unit separate from said first and second processors, said image processing unit arranged for real-time image sequence (video) processing, said image processing unit controlled in real-time by said first processor

5. The integrated circuit of claim 1, further comprising:

(a) an audio input coupled to said second processor, said second processor programmed to decode audio and said first processor programmed to output said decoded audio.

6. The integrated circuit of claim 1, further comprising:

(a) camera peripherals including IfSA, USB, NTSC/PAL encoder, and compact flash/smart media interface.

Rule 41.37(c)(1)(ix) Evidence appendix

n/a

Rule 41.37(c)(1)(x) Related proceedings appendix

n/a